Global Precipitation Analysis for Climate and Weather Studies

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ABSTRACT

This proposal focuses on the science question: How are the characteristics of global precipitation changing in terms of means, variations and extremes, and what is the confidence in our conclusions? Important characteristics of global precipitation (including global and regional means, extremes, variations and trends, and the confidence limits thereof) will be determined by extending, improving and analyzing the 25+ year standard merged precipitation analyses of the Global Precipitation Climatology Project (GPCP) of the WCRP/GEWEX and other shorter, high quality data sets such as from TRMM and Aqua/AMSR.

Specially, this project will: 1) establish the climatology of global precipitation, the mean spatial and seasonal variations, and inter-annual variations, and the uncertainty of these estimates; 2) examine inter-decadal changes and recent (25-year) trend in precipitation (global and regional) and relate these to large-scale forcing (*e.g.*, ENSO, NAO and volcano/aerosol impacts); 3) develop a climatology of precipitation extremes (and time history of such); and 4) continue to produce, monitor, validate and improve the monthly and daily global, merged GPCP analyses.

This project will also actively contribute to the integrated NEWS effort to analyze the full global water cycle as a whole, examining all the relevant observational global data sets (*e.g.*, ocean evaporation, clouds, water vapor, *etc.*), in conjunction with other investigators, to identify inconsistencies, artifacts and limitations in the data sets and better understand both the means and variations in all the water cycle components. This integration of the global observational data sets in concert with similar analyses of the water cycle in global models will likely be one of the major advances of the NEWS program.